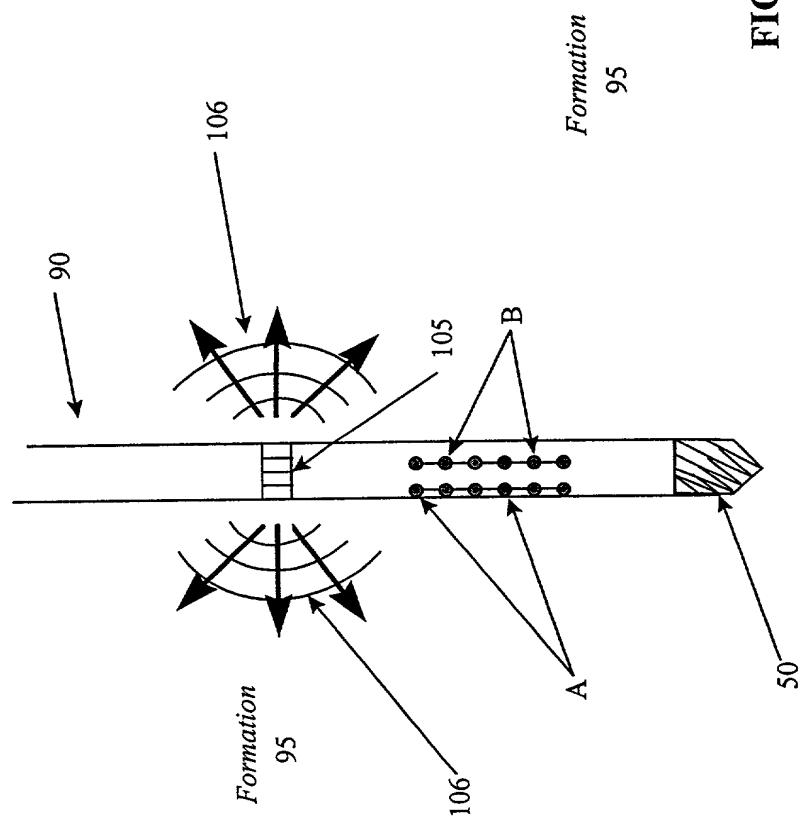


FIG. 1A

51

FIGURE 1B



Velocity Dispersion Curves for Formation and Drill-Collar Dipole Modes

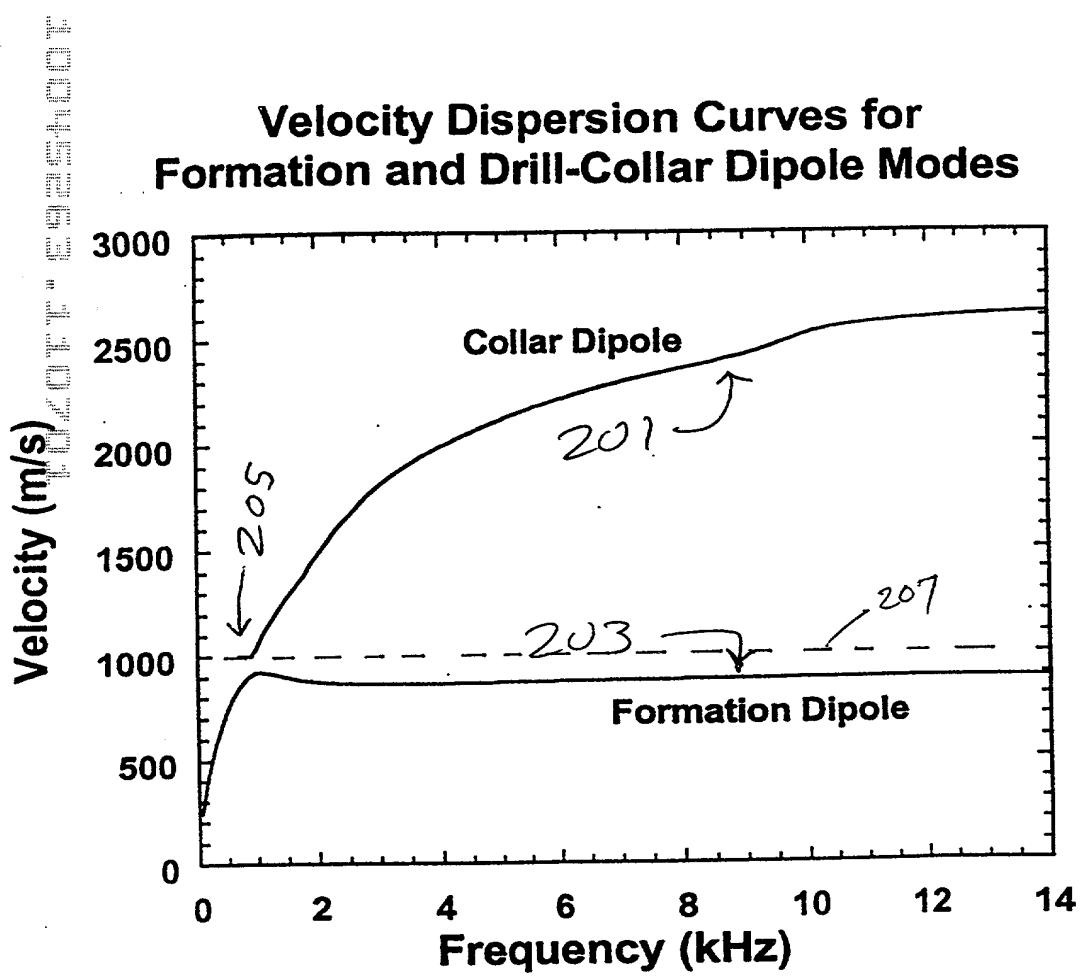


Figure 2

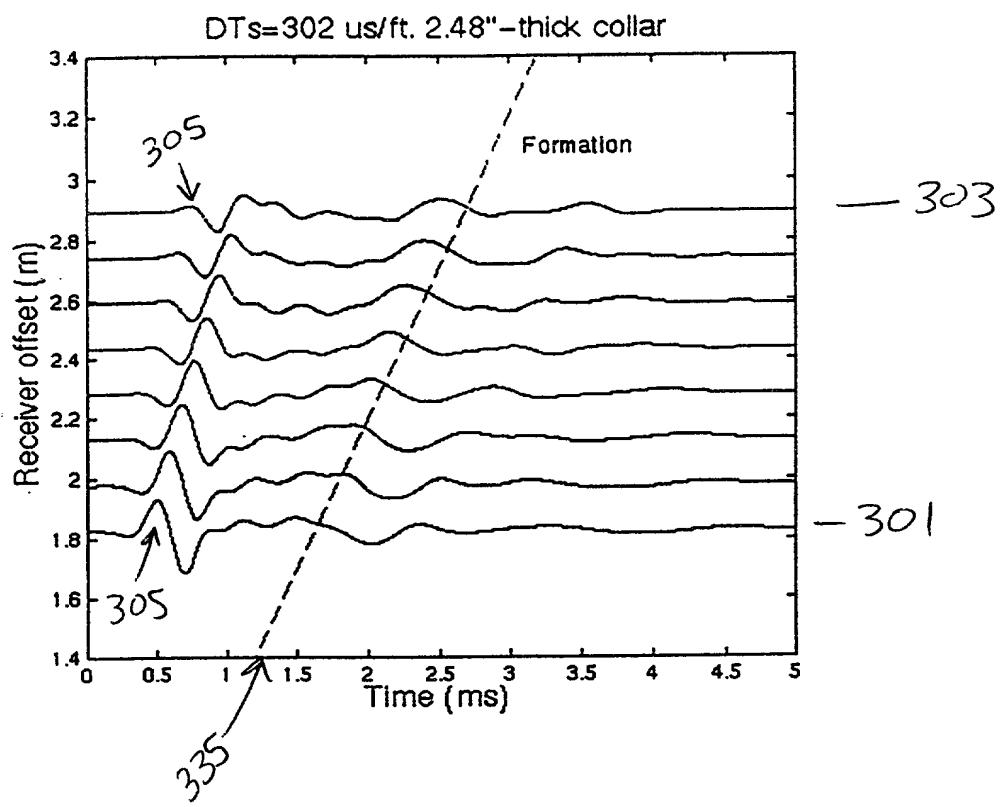


Figure 3
Dipole waveform in the presence of a drilling collar

cos 2θ azimuthal distribution of a quadrupole wavefield

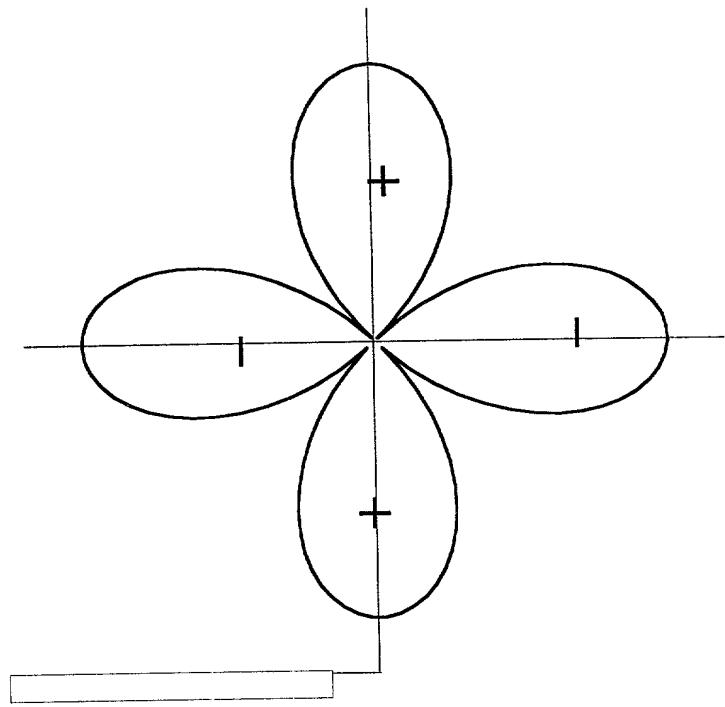


Fig. 4a

Velocity Dispersion Curves for Formation and Drill-Collar Quadupole Modes

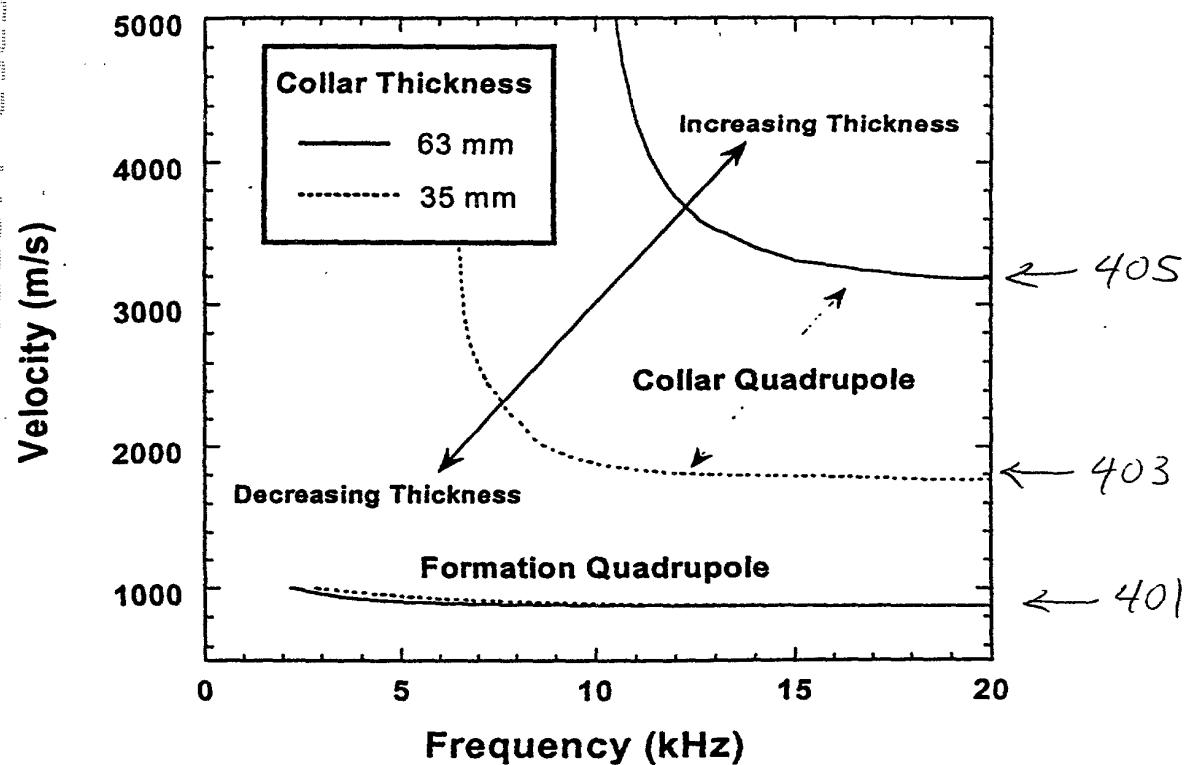


Figure 4 *b*

Figure 5A Wavefield snapshots

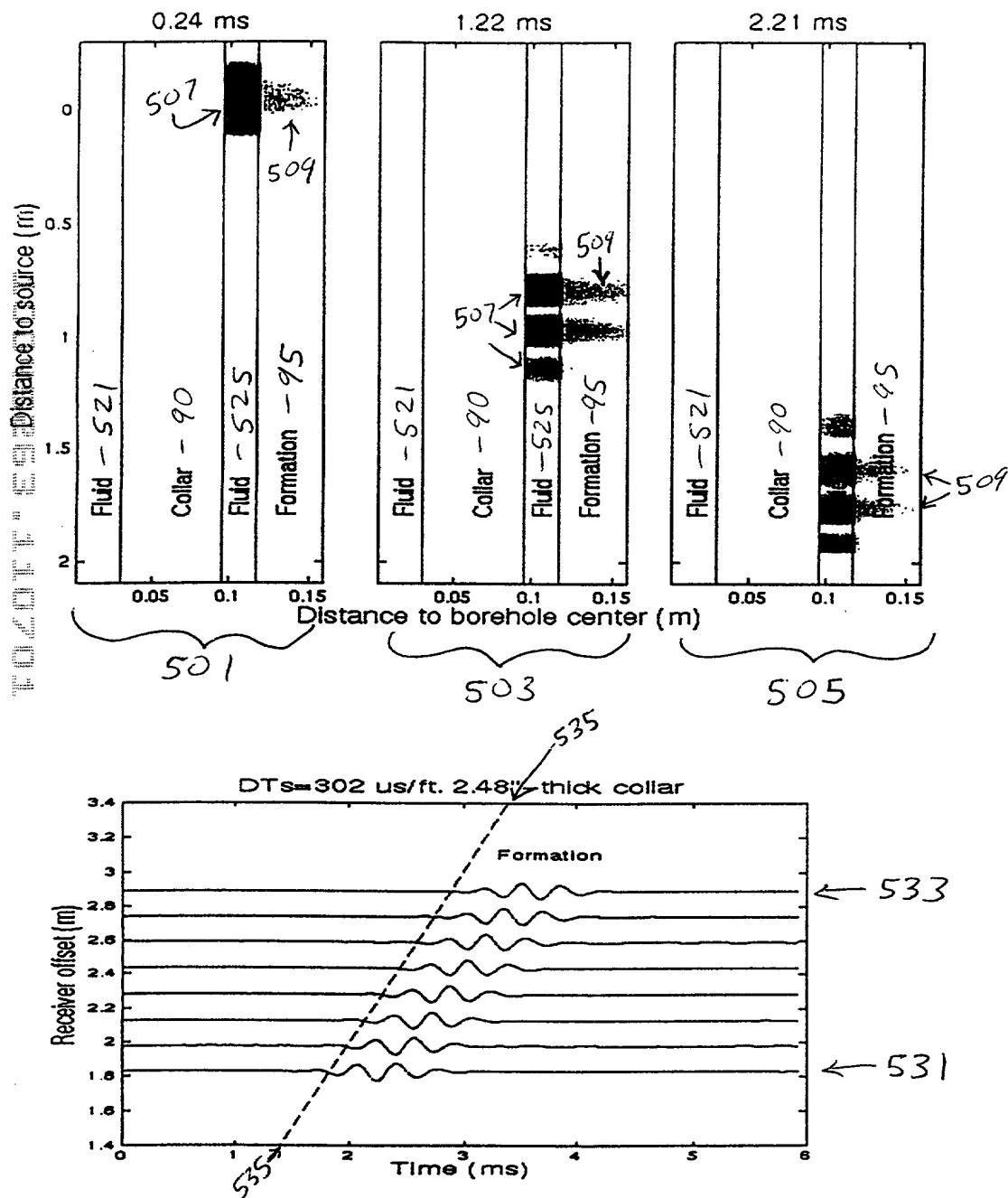


Figure 5B Quadrupole waveforms at various offsets

Figure 6A Wavefield snapshots, thin collar pipe

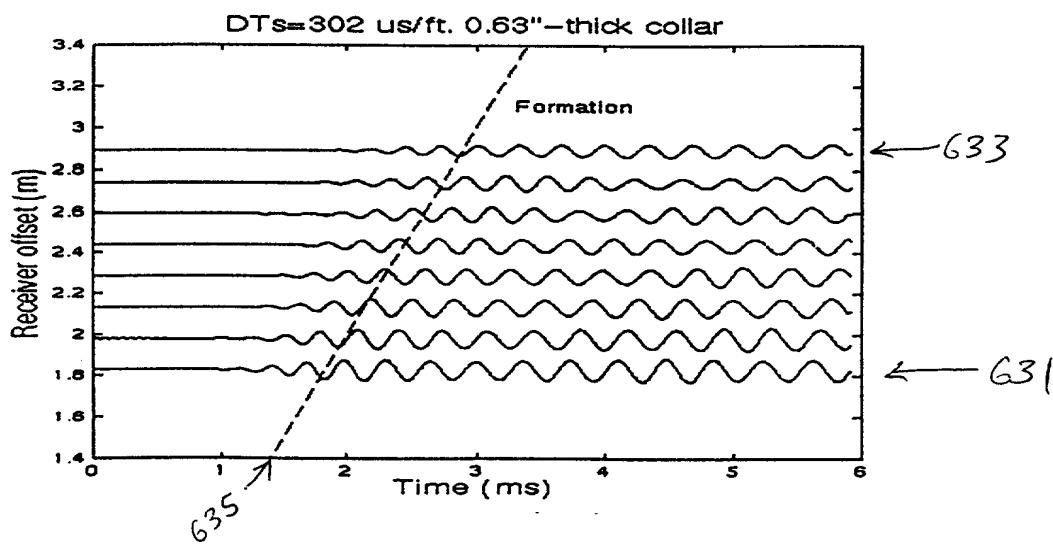
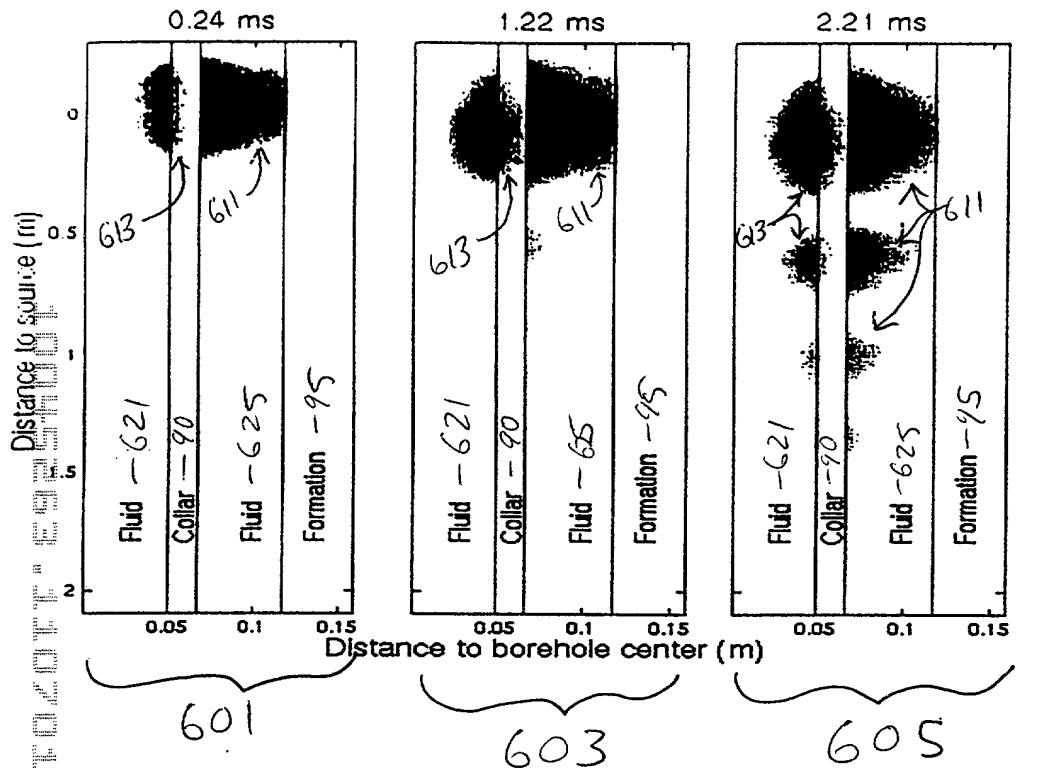


Figure 6B Quadrupole waveforms, thin collar pipe

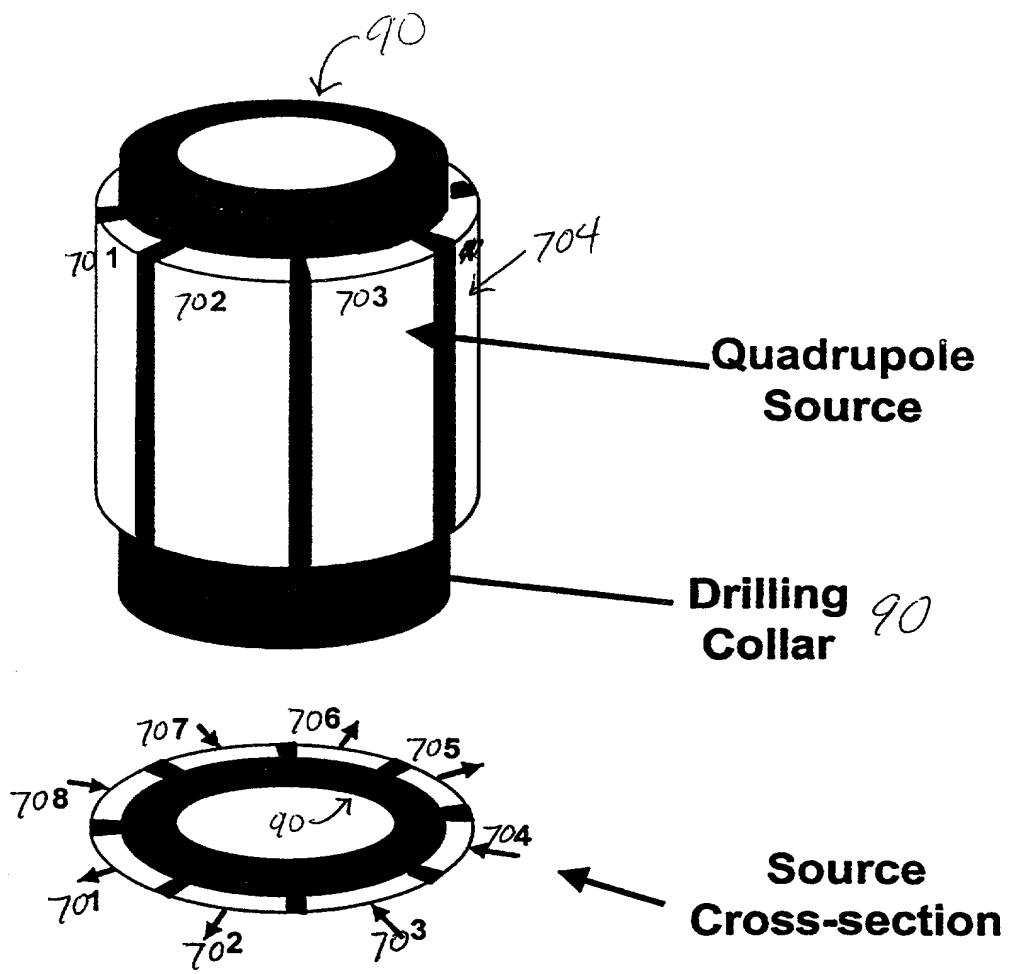


Figure 7

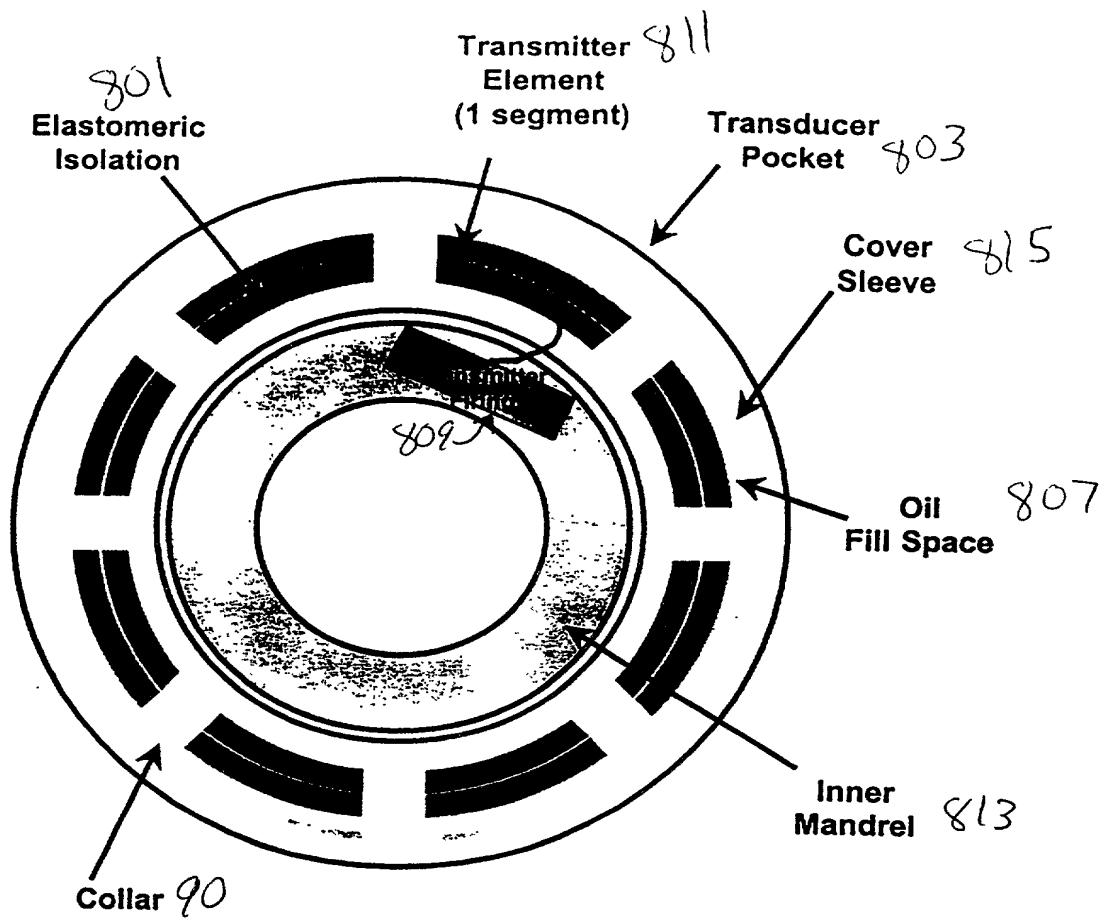


Figure 8 Segmented Ring Transmitter Example

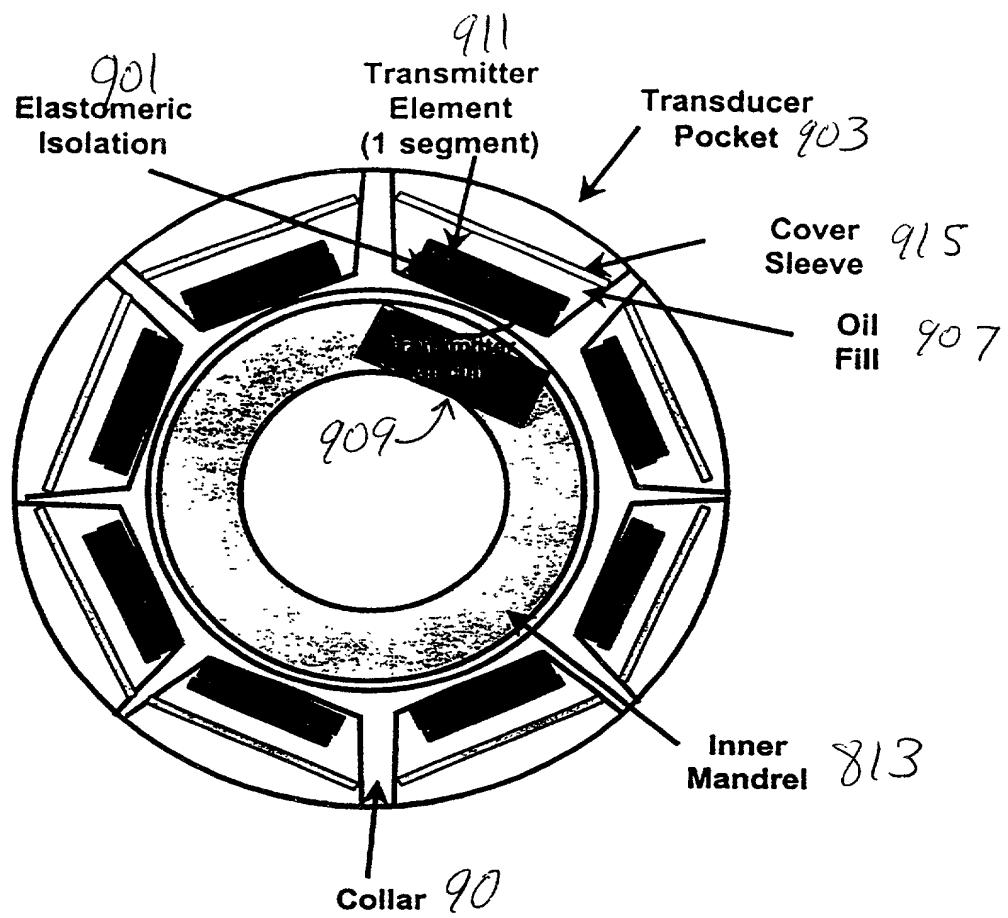


Figure 9 Individual Segmented Transmitter Example

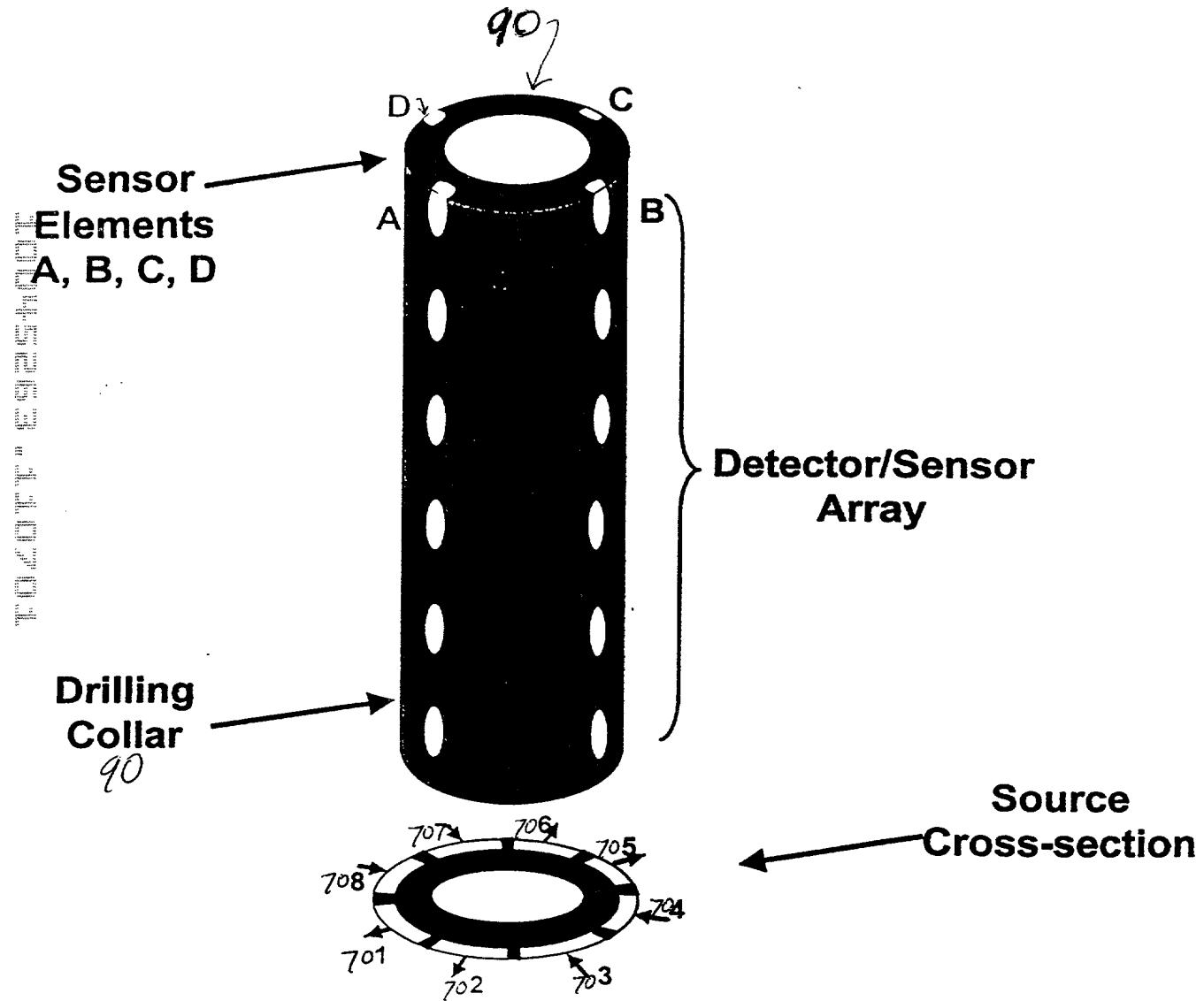


Figure 10 Sensor Array Layout

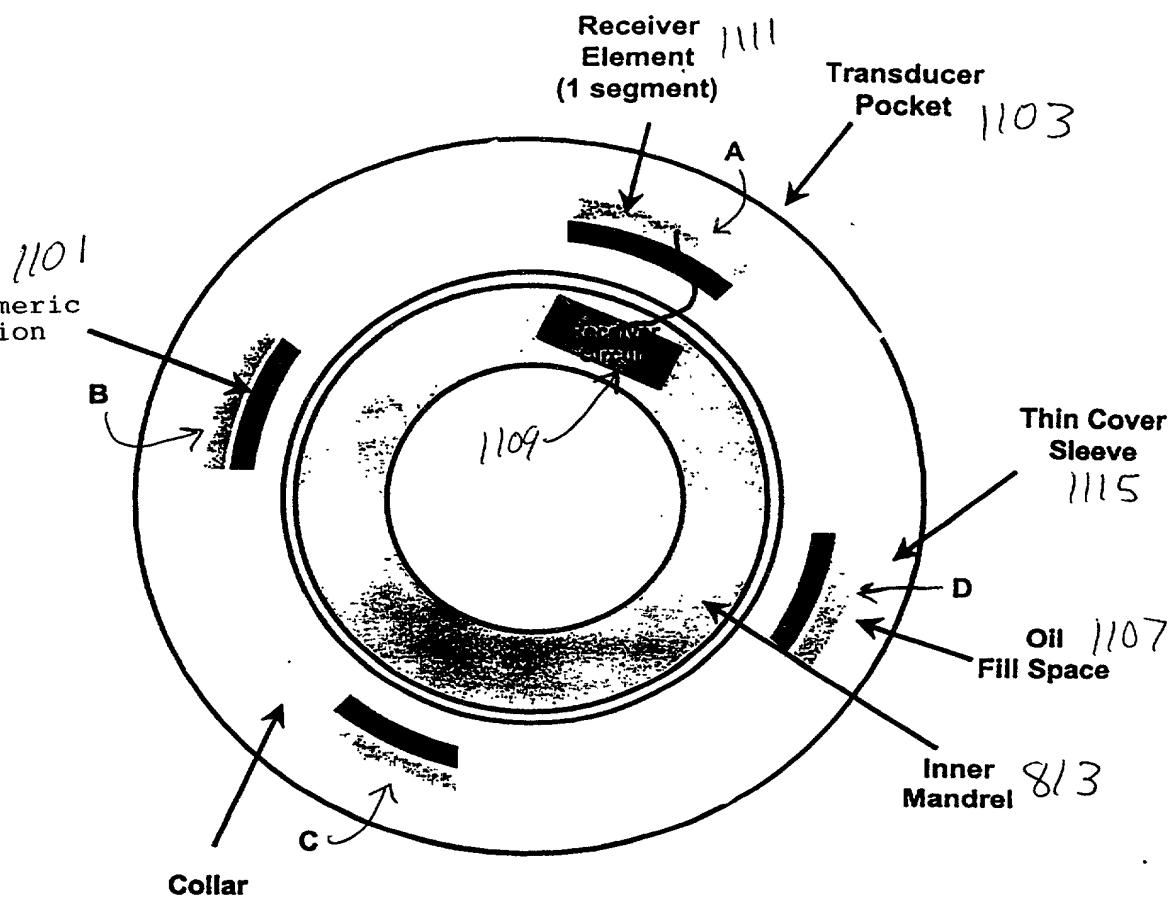


Figure 11 Segmented Ring Receiver Example

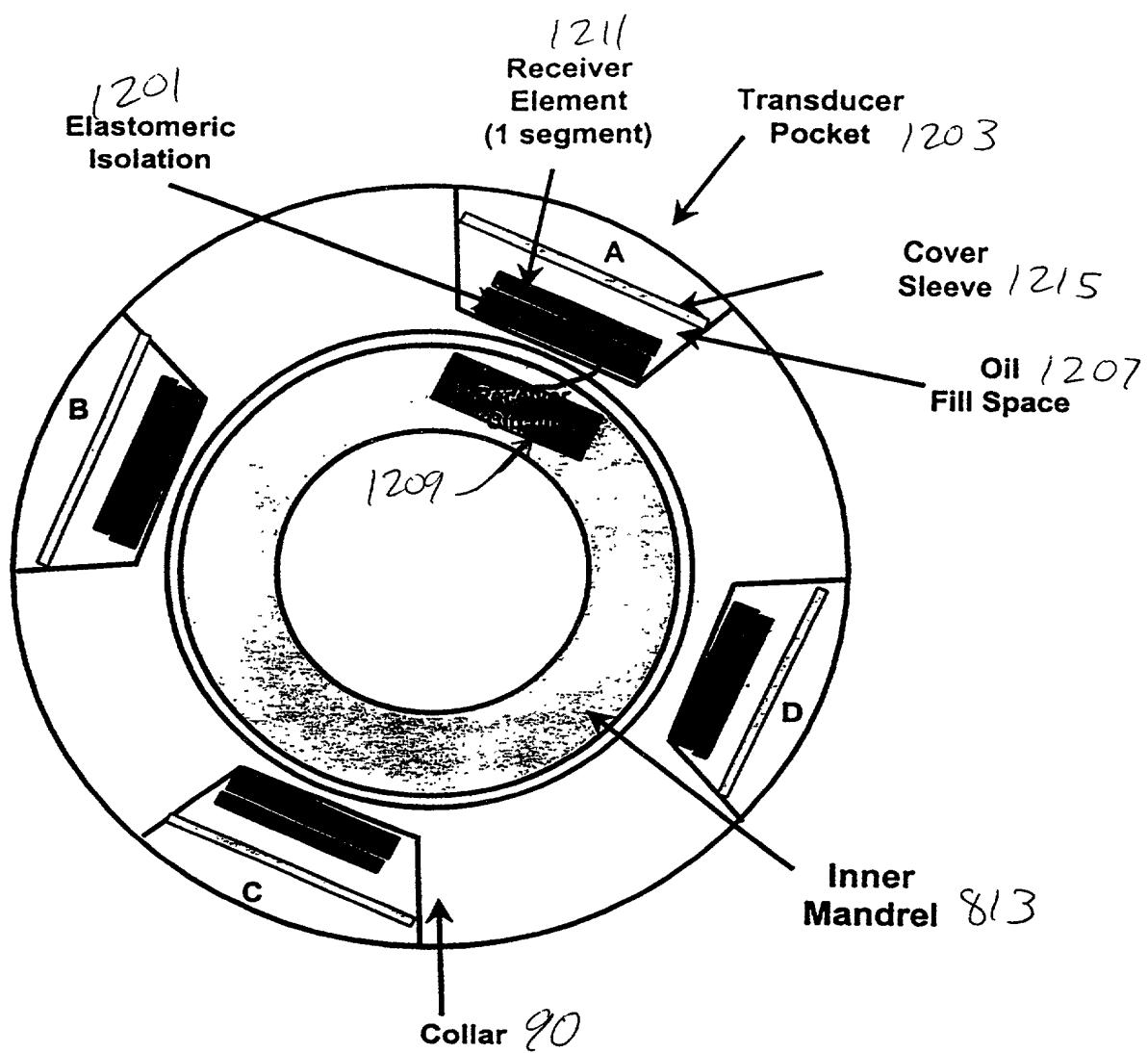


Figure 12 Individual Segmented Receiver Example

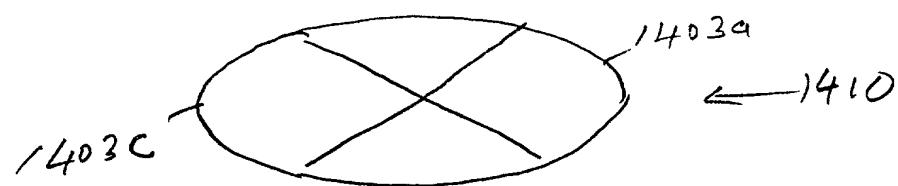
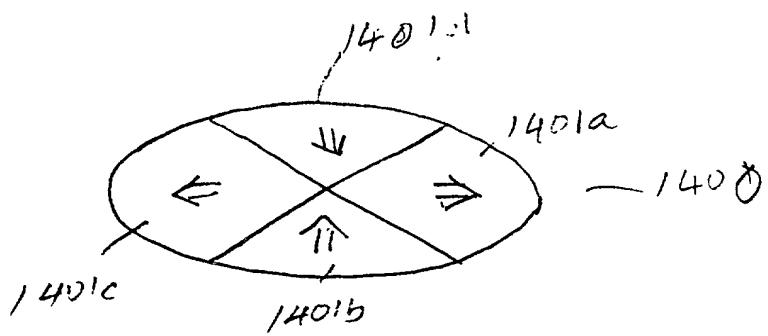


FIG. 13 a

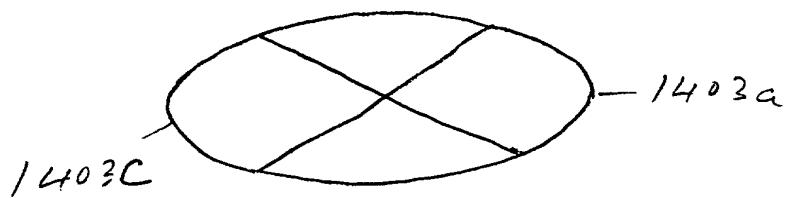
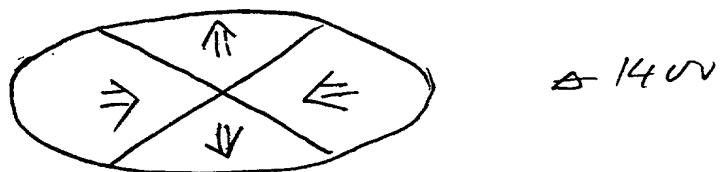


FIG. 13 b

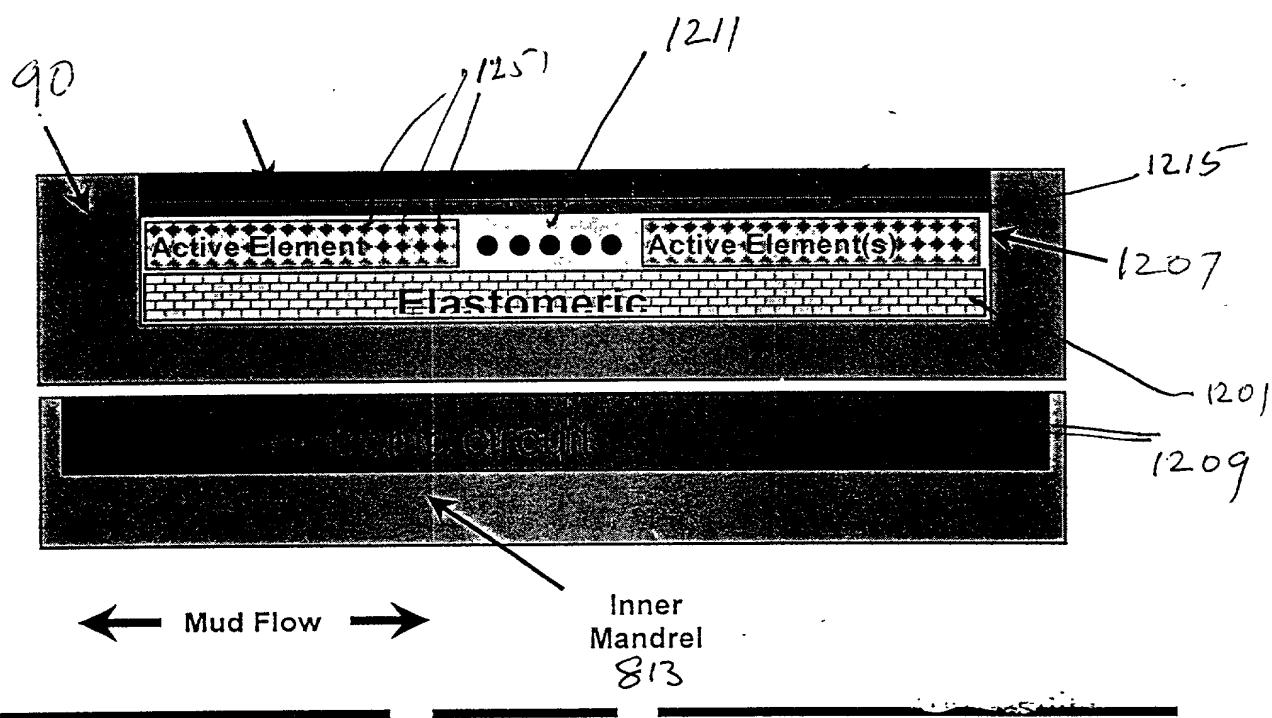


Fig. 14

Figure 15a

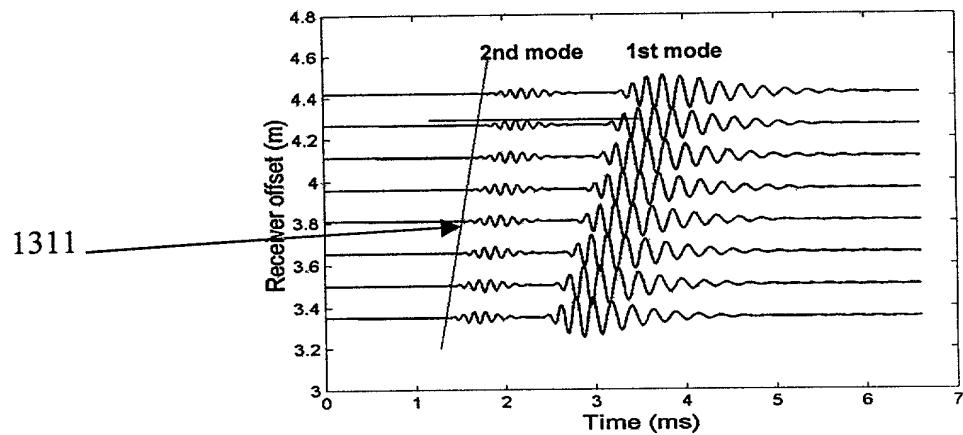
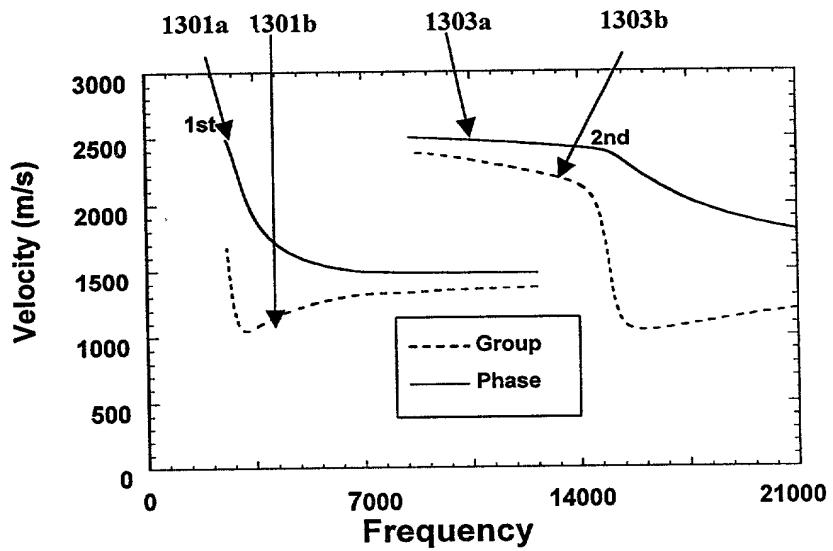
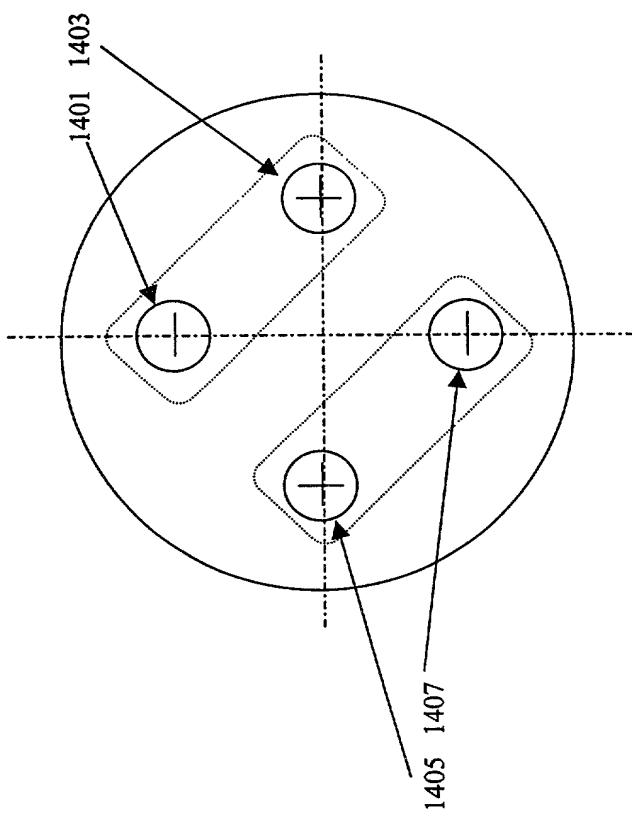


Figure 15b

Figure 16



A conceptual composition of a quadrupole source/receiver by two dipole sources/receivers.